General

Guideline Title

Disease-specific approaches. In: II guidelines for perioperative evaluation.

Bibliographic Source(s)

Gualandro DM, Yu PC, Calderaro D, Marques AC, Pinho C, Caramelli B, et al. Disease-specific approaches. In: II guidelines for perioperative evaluation. Arq Bras Cardiol. 2011;96(3 Suppl 1):10-22. [379 references]

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Committee on Perioperative Evaluation (CAPO), Brazilian Society of Cardiology. Specific assessment. In: I guidelines for perioperative evaluation. Arq Bras Cardiol 2007;89(6):e186-94.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- March 22, 2016 – Opioid pain medicines : The U.S. Food and Drug Administration (FDA) is warning about several safety issues with the entire class of opioid pain medicines. These safety risks are potentially harmful interactions with numerous other medications, problems with the adrenal glands, and decreased sex hormone levels. They are requiring changes to the labels of all opioid drugs to warn about these risks.

Recommendations

Major Recommendations

The definitions for levels of evidence (A-C) and classes of recommendation (I-III) are provided at the end of the "Major Recommendations" field.

Hypertension

Degree of Recommendation I

- If blood pressure is high and there is enough time before surgery to reduce it with proper medications, do so; Level of Evidence C.
- The antihypertensive medication (including angiotensin-converting enzyme [ACE] inhibitors) must be continued during the perioperative period, including on the day of the procedure; Level of Evidence C.
- If blood pressure is high and there is not enough time before surgery to reduce it with proper medications, administer a beta-1 receptor blocker with rapid onset (esmolol) to keep the blood pressure from rising during intubation. Oral clonidine can be used when esmolol is contraindicated; Level of Evidence C.
- Hypokalemia, if present, must be corrected before surgery; Level of Evidence C.
- The reintroduction of antihypertensive medication, preferably the one that the patient was using before surgery, should be done as soon as possible; Level of Evidence C.
- Volume management should be done during the perioperative period; Level of Evidence C.

Congestive Heart Failure (CHF)

Degree of Recommendation I, Level of Evidence C

- Assessment of patients with CHF symptoms must focus on determining its etiology and functional consequences of myocardial dysfunction.
- Treatment must be optimized before surgery and patient must continue to take medications during the entire perioperative period (including the day of surgery).
- Anesthetic agents that depress myocardial contractility must be avoided in patients with CHF.
- Volume management must be rigorous. Invasive monitoring can be useful during the intraoperative and early postoperative periods of patients with severely depressed cardiac function.
- The use of beta-adrenergic agonists must be avoided in patients with hypertrophic cardiomyopathy.
- Patients in New York Heart Association (NYHA) functional class III/IV should have elective surgery postponed until the optimization of medication and symptom improvement, if possible.

Valvular Heart Diseases

Degree of Recommendation I

- Patients with valvular heart disease, mainly if anatomically important, should be referred to a cardiologist before noncardiac surgery; Level of Evidence C.
- Patients with valvular heart disease with indication for valve intervention treatment should primarily receive cardiac treatment and then undergo the noncardiac treatment proposed; Level of Evidence B.
- Symptomatic patients with valvular heart disease undergoing noncardiac surgery should receive optimal drug and behavioral treatment, including on the day of surgery; Level of Evidence C.
- Control of blood volume and electrolytic disorders must be given special attention in patients with important valvular heart disease; Level of Evidence C.
- Monitoring with invasive blood pressure can be used in patients with important valvular heart disease; Level of Evidence C.
- There is no indication of beta-blockers, statins, or routine nitroglycerin in patients with valvular heart disease; Level of Evidence C.
- All patients with valvular heart disease should be assessed regarding the need for prophylaxis of infective endocarditis; Level of Evidence B.
- All patients with heart valve disease or prosthetic valve on continuous oral anticoagulation therapy should be assessed regarding the need for adjustments and anticoagulation with heparin in the perioperative period; Level of Evidence B.

Degree of Recommendation IIa

- Patients with severe asymptomatic aortic stenosis with intermediate and high-risk noncardiac surgery scheduled should be submitted to the interventional treatment of heart valve disease before noncardiac surgery. Level of Evidence C.

Cardiac Arrhythmias

Situations in which cardiologist assessment should be strongly considered before surgery because of the presence of cardiac arrhythmias:

Degree of Recommendation I, Level of Evidence C

- Symptoms related to low output or syncope, in the presence of structural heart disease associated with compromised left ventricular systolic function and/or myocardial ischemia
- Symptoms related with tachyarrhythmias in patients with ventricular preexcitation syndrome with well-defined sudden onset and termination, associated or not with low output, without clinical findings or adequate treatment

Degree of Recommendation IIa, Level of Evidence C

- Symptoms related to tachyarrhythmias, regardless of structural heart disease, in patients with well-defined, frequent and recent symptoms of tachycardia episodes of sudden onset and termination
- Symptoms related to low output or syncope in elderly patients with a baseline heart rate below 50 beats per minute
- Asymptomatic patients with permanent atrial fibrillation to assess control of heart rhythm
- Asymptomatic patients with very frequent isolated ventricular arrhythmias or repetitive ventricular arrhythmias associated with structural heart disease

Conduction Disorders

Situations in which cardiologist assessment should be strongly considered before surgery:

Degree of Recommendation I, Level of Evidence C

- High degree atrioventricular (AV) block: Type II second-degree AV block, 2:1 AV block, paroxysmal third-degree AV block, permanent third-degree AV block, or AV dissociation

Degree of Recommendation IIa, Level of Evidence C

- Low-risk AV block on resting electrocardiogram (ECG) but with symptoms that suggest low output or syncope
- Trifascicular block
- Bifascicular AV block on resting ECG but with symptoms that suggest low output or syncope

Implanted Pacemakers and Implantable Cardioverter Defibrillators

The operative period was divided into preoperative evaluation, preoperative preparation, intraoperative care, and postoperative care. The recommendations were grouped in these periods to facilitate the monitoring of patients with pacemakers or implantable cardioverter defibrillators (ICDs). The suggested sequence should be followed for each patient:

A. Preoperative Period
   Degree of Recommendation I

   - Determine if the patient uses a single or dual-chamber pacemaker, resynchronizer, defibrillator, or multiple prostheses based on the clinical history, physical examination, scar evaluation, electrocardiographic record, and chest or abdomen X-ray; Level of Evidence C.
   - Use the identification card, radiological identification number or hospital records to determine what type of device the patient is using; Level of Evidence C.
   - Determine if the patient depends on the pacemaker by reviewing clinical history (syncopes and/or dizziness before the implant; successful nodal ablation), data from previous assessments or decreasing the timing of the device to the lowest rate and observing if an escape focus occurs and its stability; Level of Evidence C.
   - Assess whether there is a risk of electromagnetic interference during the surgical procedure planned; Level of Evidence B.
   - Evaluate the possibility of interaction between the anesthetic technique, anesthesia equipment, and drugs to be used during the procedure and the patient with pacemaker or defibrillator; Level of Evidence C.

   Degree of Recommendation IIa, Level of Evidence C

   - Determine the function of the pacemaker with an assessment by an expert to adjust the set up; if an expert is not available, at least check if there is effective pacemaker pacing artifact (that generates pacing) in the ECG and contact the manufacturer of the prosthesis about additional recommendations.
   - Advise the surgical team to use the bipolar or ultrasonic electrocautery when possible.
   - Discontinue the antitachycardia therapies according to the possibility in each case.

   Degree of Recommendation IIb, Level of Evidence C

   - Assess whether reprogramming the pacemaker to asynchronous mode and disabling the sensor frequency is advantageous to the procedure.

B. Intraoperative Period
   Degree of Recommendation I, Level of Evidence C

- Equipment for temporary artificial cardiac stimulation and defibrillation must be available in the surgery room for immediate use.
- All patients must be monitored by continuous ECG and plethysmography (or auscultation, pulse palpation, or ultrasound) regardless of the type of anesthesia.
- Electrocautery: safe cardiac stimulation: These patients need to see their pacemaker physicians before being submitted to elective surgeries for a complete assessment of the stimulation system. The physician will determine if the pacemaker settings need to be changed, issue a document with warnings for the surgeon and anesthesiologist and describe the behaviors that the pacemaker may display during surgery. Usually, the biggest concern involves those patients who will be submitted to major surgeries with the use of electrocautery. In these cases, a safety procedure should be done always in a pacemaker check-up clinic and by a certified pacemaker physician. If electrocautery cannot be substituted by ultrasonic scalpel, the document must contain at least the recommendations listed in below:
    - Continuous cardiac monitoring with ECG monitor and pulse oximetry (heart rhythm monitoring is possible even during electrocautery).
    - Use bipolar electrocautery. If bipolar is not available, use monopolar electrocautery but place the grounding pad far from the pacemaker and prepare the skin and in the region, eliminate oils using alcohol-ether. If the dispersive lead is reusable, apply a thin and homogeneous layer of electrolyte paste on its surface.
    - The dispersive lead should be placed far from the pacemaker, preferably near the surgical field, minimizing the electrical field. Thus, in an abdominal or pelvic surgery, the dispersive lead should be placed near the tailbone; in a surgery on the right hand, the dispersive lead should be placed in the right forearm, and in a head surgery, the dispersive lead should be placed on the neck. The pacemaker and its leads must always stay away from the electric field generated by the electrocautery.
    - Ground the electrocautery device properly by connecting it to a good grounding wire.
    - Limit the use of the electrocautery probe as much as possible and to very short periods and always monitor the ECG or heart rate. Generally, when the electrocautery probe is used, the ECG monitor is unreadable and monitoring can be done by plethysmography, which does not suffer interference from the electrocautery.
    - If bradycardia or tachycardia occur during electrocautery (because of electromagnetic interference), place a magnet over the pacemaker every time the electrocautery probe is used. The magnetic response of each pacemaker can be different, and in some cases it may not exist (to be turned off by default). A good practice is to do some testing before surgery, but the patient must keep being monitored, allowing to observe the magnetic response of the device. Additionally, the magnetic behavior of the pacemaker of each patient must be informed by the patient's specialist doctor, as this depends on the set up of the device.
    - Remind the patient to return to the pacemaker checkup clinic after the postoperative recovery period so that the original settings can be restored and the pacemaker reassessed.
    - In individuals with a multisite cardiac resynchronization device, the presence of more leads in the heart undeniably increases the likelihood of complications due to external interferences on the stimulation system. Most stimulation leads used in the venous system of the left ventricle are unipolar, thus are more susceptible to external interferences, especially those caused by electrocautery; however, there is a current trend to use bipolar leads, but many unipolar leads have been implanted and will remain so for many years. The presence of more electrodes and unipolar electrodes requires doctors to carefully consider the items mentioned above, more accurately and giving greater attention to signs that there is interference on the multisite stimulation system. In addition, these patients are at higher risk because of their heart failure.
- Radio frequency ablation: place the grounding pads far from the generator and leads and do not allow the ablation catheter to touch the pacemaker's leads.
- Cardioversion or defibrillation: During the perioperative period, patients with a pacemaker or implantable cardioverter-defibrillator may have complications that require an electrical cardioversion or defibrillation. Although the generators can theoretically withstand the shocks, in practice it is advisable to avoid them whenever possible. When indispensable, some cautions must be taken to preserve the pacemaker or defibrillator, the leads and the lead-heart interface, as described below.
    - Internal cardioversion is preferred in patients with internal implantable cardioverter-defibrillators (ICD) since it uses less energy, biphasic pulse, and internal safety resources of the device itself.
    - For external shocks, prefer cardioverters that come with adhesive pads. Place them anteroposteriorly, according to the polarity informed by the manufacturer. Avoid the standard placement of the pads (between the base and apex of the heart – parallel to the leads) since the myocardium may be injured by the tip of the lead.
    - Attach the pads as far as possible from the generator and leads.
    - Use as little energy as possible. Modern cardioverters delivering biphasic shocks should be preferred.
    - Place a magnet over the generator, except in ICDs that can disable the antitachycardia function if the magnet remains over them for longer than 30 seconds. Older pacemakers invariably shut down when a magnet is placed over them and become asynchronous. Conversely, modern rate-responsive devices are programmable and can have different behaviors. Thus, placing a magnet over the generator does not necessarily protect the device during a cardioversion.

- Verify the sensing and pacing thresholds after the procedure. Consider reassessing the device in 24 hours and monitor the patient during this time.

- Radiotherapy: Radiotherapy can be used provided that the focus of radiation is not directed to the pacemaker/ICD. If the devices are close to the focus of radiation, the area should be covered using a lead shield. If the irradiated site is exactly in the region of the implant or very close to it and the patient needs many radiotherapy sessions, the possibility of reimplanting the pacemaker or ICD in another site far from the point of irradiation should be considered. Radiotherapy on the pacemaker can cause temporary or permanent dysfunction and premature wear of the battery. Radiotherapy on the leads may cause fibrosis and loss of command because of increase in the stimulation threshold.

Degree of Recommendation IIa, Level of Evidence C

- Lithotripsy: When lithotripsy is required in patients with pacemaker and/or defibrillator, direct the focus away from the area of the device and leads. Turn off atrial stimulation when using ECG-triggered lithotripsy to avoid that the device synchronize according to the atrium. Setting up the atrial channel with less energy and in the bipolar mode can solve the problem, keeping the dual-chamber stimulation more physiological. A test may be performed before the effective application, observing the behavior and interaction of devices. Do not immerse the body part that contains the pacemaker or ICD when performing immersion lithotripsy.
- Magnetic resonance imaging (MRI): Patients with pacemakers or defibrillators should not undergo MRI tests. There is a risk of dysfunction of the prosthesis and leads, and they can be displaced because of the magnetic field generated. Although there are pacemakers prepared to support the field of resonance, they depend on specific leads and specific set up during the procedure, requiring the presence of an expert along with the programmer of the generator during the test. Even these prostheses were designed to withstand limited magnetic fields (0.5 Tesla).

C. Postoperative Period
Degree of Recommendation I, Level of Evidence C

- Heart rate and rhythm must be continuously monitored during the postoperative period.
- Cardioversion/defibrillation equipment and resources for cardiac stimulation must be available.
- If the functions of the pacemaker were changed for surgery, reprogram it back to its usual settings as soon as possible.
- The antiarrhythmic medications that were being used before surgery should be resumed as soon as possible.

<u>Transplants</u>

Liver

Recommendations for additional tests in the preoperative period of liver transplantation:

Degree of Recommendation I

- Request ECG and chest X-ray routinely for all patients; Level of Evidence C.
- Request transthoracic echocardiography for all patients; for patients with systolic pulmonary artery pressure (SPAP) higher than 40 mmHg, further evaluation with hemodynamic measurements; Level of Evidence B.

Kidney

Risk Stratification for the Presence of Coronary Artery Disease

The authors of the guideline propose the following risk stratification of asymptomatic patients with chronic renal failure from a cardiovascular standpoint being evaluated for kidney transplantation according to the presence or absence of these three risk factors:

Degree of Recommendation I

- Patients with no risk factors are considered at low cardiovascular risk, with no indication for further investigation; Level of Evidence C.

Degree of Recommendation IIa

- Patients who have only one of the risk factors are considered to be at intermediate cardiovascular risk and should undergo noninvasive stratification. In case of a positive result, perform further research on invasive coronary angiography, and in case of a negative, do the transplant; Level of Evidence C.
- Patients who have at least two risk factors are considered to be at high cardiovascular risk and should undergo invasive test before transplantation; Level of Evidence C.

Heart Disease and Pregnancy

Safety for Additional Tests in the Preoperative Period of Pregnant Patient with Heart Disease

Degree of Recommendation I, Level of Evidence C

- Resting or dynamic ECG and Doppler echocardiography do not pose any risk for mother or fetus.
- Chest X-ray can be used.
- Myocardial scintigraphy is not advised (exposure to radiation); gallium-97 scintigraphy is contraindicated.
- Coronary cineangiography can be performed using abdominal protection.
- Nuclear magnetic resonance is not contraindicated during pregnancy.

General Recommendations for Non-obstetric and Non-cardiac Surgery in Pregnant Women with Heart Disease

Degree of Recommendation I, Level of Evidence C

- Surgery should preferably be done between 13 and 24 weeks of gestation according to the following recommendations:
    - Intra- and postoperative continuous fetal monitoring using cardiotocography or Doppler ultrasound in pregnancy with viable fetuses (>24 weeks)
    - Intraoperative maneuver for the deviation of the uterus to the left with the aid of a pad under the right flank in pregnancies after 20 weeks
    - Prophylactic therapy with corticosteroids in the preoperative period for pregnant women between 24 and 34 weeks
    - Presence of the team of obstetricians and neonatologists for possible emergency cesarean section (>24 weeks)
    - Reduced manipulation of the uterus to prevent uterine contraction
    - Tocolytic prophylaxis in the intra- and postoperative period with use of progesterone (250 mg/day/vaginal) should be decided by the obstetric team.
    - Prophylaxis with metoclopramide and H2 antagonists for gastric protection; opioids and antiemetic drugs; prevention of adynamic ileus
    - Effective analgesia and sedation for pain relief and anxiety
    - Preoxygenation at 100% using oxygen mask during 3-5 minutes before induction for effective oxygenation
    - Extreme hyper- and hypoventilation cause reduction in the placental flow and maternal-fetal hypoxia
    - Solid food fasting for at least 8 hours before surgery
    - Crystalloid solution during surgery can cause acute pulmonary edema in the postoperative period.
    - Solutions containing glucose should be avoided when delivery is imminent to reduce the risk of neonatal hypoglycemia.
    - Foley catheter to prevent build up of urine in the bladder
    - Maintenance of routine cardiovascular medication and antibiotics
    - Early ambulation can cause preterm birth.
    - Subcutaneous or intravenous heparin should be the anticoagulant of choice in conventional doses.
    - Non-steroid anti-inflammatory drugs should be avoided because they may cause premature closure of the ductus arteriosus (>32 weeks).
    - Converting enzyme inhibitors and angiotensin I blockers are contraindicated.

Dental Procedures

Dental assessment with elimination of infective foci and intensive control of oral hygiene of in-patients is advisable whenever possible before surgical procedures in patients with or without heart disease in order to reduce perioperative complications [Degree of Recommendation IIa; Level of Evidence A].

Use of Local Anesthetics: To Use or Not To Use Local Vasoconstrictors

Degree of Recommendation I, Level of Evidence C

- In cardiac patients, the use of small amounts of local anesthetics with vasoconstrictor for dental procedures is safe and should be used preferentially.

Dental Procedures in Patients Using Antithrombotic Drugs (Aspirin, Clopidogrel, Heparin, Oral Anticoagulants)

During antithrombotic therapy, dental procedures may be performed by following a few precautions:

Degree of Recommendation I

- International normalized ratio (INR) control at least 24 hours before the dental procedure; Level of Evidence C.
- Patients with INR <3.0 do not have to discontinue oral anticoagulation therapy before simple surgeries (extraction of ≤3 teeth, gingival surgery, or periodontal scaling). When the INR ≥3.0 and the planned procedures are more extensive, discuss with the physician in charge; Level of Evidence C.
- Do not discontinue use of aspirin for dental procedures; Level of Evidence B.

Specific Considerations for Dentists

Some precautions and measures can be adopted to reduce bleeding in patients on antithrombotic drugs:

Degree of Recommendation I, Level of Evidence C

Preoperative Care

- Assess the patient's complete medical history.
- Measure the INR 24 hours before the dental procedure. In patients with stable INR control, evaluation 72 hours before the procedure is acceptable.

Intraoperative Care

- Minimize surgical trauma.
- Schedule larger number of visits when there is extraction of more than three teeth.
- Reduce areas of periodontal surgery and scaling and root planning (per quadrant).
- Plan the surgeries earlier in the day and in the beginning of the week.

Control of Postoperative Bleeding

- Removal of nonabsorbable suture after 4-7 days
- Compression with gauze for 15-30 minutes after the surgical procedure
- Use of coagulating agents: gelatin sponge, oxidized regenerated cellulose, synthetic collagen, tranexamic acid mouthwash in 4.8% aqueous solution during and 7 days after the surgery, using 10 ml, 4 times a day for 2 minutes or mouthwash with ε-aminocaproic acid (when possible)
- Appropriate sutures to close wounds

General Recommendations

Degree of Recommendation I, Level of Evidence C

- Cardiac patients on optimal medication can safely undergo dental procedure with usual routine precautions.
- Individuals using pacemakers and automatic implantable cardiac defibrillators are not affected by high or low rotation speed drills, amalgam mixer, electrical pulp testing, laser, electric toothbrushes, endodontic ultrasound, periodontal ultrasound, and radiography. The use of electrocautery has specific guidelines (see recommendations under Implanted Pacemakers and Implantable Cardioverter Defibrillators, Intraoperative Period, above).

Aortic Surgery

Degree of Recommendation IIa, Level of Evidence A

- In patients considered to be at high surgical risk and with anatomy conducive to percutaneous treatment, endovascular repair of aortic aneurysm is preferable to open surgery because of lower perioperative mortality.

Definitions:

Levels of Evidence

A. Evidence in several populations from multiple randomized clinical trials or meta-analyses
B. Evidence in a limited group of populations from single randomized clinical trial or non-randomized clinical studies
C. Evidence in very limited group of populations from consensus and experts' opinions, case reports and series

Degree/Class of Recommendation - Reflecting the Size of Treatment Effect

Degree of Recommendation I - Benefit >>> Risk; the treatment/procedure must be indicated/administered

Degree of Recommendation IIa - Benefit >> Risk; the choice for the treatment/procedure may help the patient

Degree of Recommendation IIb - Benefit > Risk; is not defined if the treatment/procedure can help the patient

Degree of Recommendation III - Risk > Benefit; the treatment/procedure must not be performed since it does not help and may be harmful for the patient

Clinical Algorithm(s)

None provided

Scope

Disease/Condition(s)

Any condition requiring surgery, including cardiac surgery, liver or kidney transplant, dental procedures, or aortic surgery

Guideline Category

Diagnosis

Evaluation

Management

Prevention

Risk Assessment

Screening

Treatment

Clinical Specialty

Anesthesiology

Cardiology

Colon and Rectal Surgery

Dentistry

Nephrology

Neurological Surgery

Obstetrics and Gynecology

Orthopedic Surgery

Plastic Surgery

Surgery

Thoracic Surgery

Intended Users

Physicians

Guideline Objective(s)

- To refine and unify the terminology used by the entire multidisciplinary team, including the patients and their family
- To establish new routines, change indication for surgery according to the information obtained during the perioperative evaluation
- To inform the patient and the team on the possible risks related to the intervention
- To decrease perioperative complications

Target Population

Patient who require surgery and who have any of the following diseases or conditions:

- Coronary artery disease
- Hypertension
- Congestive heart failure
- Valvular heart disease
- Cardiac arrhythmias
- Conduction disorders
- Implanted pacemakers and implantable cardioverter-defibrillators
- Heart disease and the need for liver or kidney transplant
- Heart disease and pregnancy
- Heart disease and the need for dental procedures
- Aortic aneurysm

Interventions and Practices Considered

1. Determination of cardiac functional capacity
2. Risk assessment
3. Cardiology referral
4. Blood pressure regulation
5. Electrolyte regulation
6. Blood volume management
7. Infective endocarditis prophylaxis
8. Management of anticoagulation therapy (heparin, warfarin)
9. Management of implantable pacemakers and cardioverter-defibrillators
10. Additional testing in pregnancy and liver transplantation
11. International normalized ratio control during dental procedures

Major Outcomes Considered

- Perioperative complications, morbidity, and mortality
- Sensitivity and specificity of tests for risk assessment
- Cost-effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

The databases searched were PubMed, Scielo, and Lilacs. The guideline was updated, based on the last version of the guideline and new evidence from 2007 to 2010 was obtained. There were no specific search terms. Articles published in Portuguese and English were included.

Number of Source Documents

Not stated

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Levels of Evidence

A. Evidence in several populations from multiple randomized clinical trials or meta-analyses
B. Evidence in a limited group of populations from single randomized clinical trial or non-randomized clinical studies
C. Evidence in very limited group of populations from consensus and experts' opinions, case reports and series

Methods Used to Analyze the Evidence

Review of Published Meta-Analyses

Systematic Review

Description of the Methods Used to Analyze the Evidence

Not stated

Methods Used to Formulate the Recommendations

Expert Consensus

Description of Methods Used to Formulate the Recommendations

Not stated

Rating Scheme for the Strength of the Recommendations

Degree/Class of Recommendation - Reflecting the Size of Treatment Effect

Degree of Recommendation I - Benefit >>> Risk; the treatment/procedure must be indicated/administered

Degree of Recommendation IIa - Benefit >> Risk; the choice for the treatment/procedure may help the patient

Degree of Recommendation IIb - Benefit > Risk; is not defined if the treatment/procedure can help the patient

Degree of Recommendation III - Risk > Benefit; the treatment/procedure must not be performed since it does not help and may be harmful for the patient

Cost Analysis

The indiscriminate use of invasive investigation by means of coronary angiography is not justified for use in the identification of significant coronary artery disease because it is a high cost, non-invasive method with risk of complications; in addition, the prevalence of significant coronary artery disease in patients indiscriminately evaluated by invasive methods is less than 50%.

Method of Guideline Validation

Peer Review

Description of Method of Guideline Validation

Not stated

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of supporting evidence is identified and graded for each recommendation (see the "Major Recommendations" field).

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

Appropriate use of disease-specific approaches to perioperative evaluation, which may lead to reduced perioperative complications, morbidity, and mortality

Potential Harms

Implanted Pacemakers

Radiotherapy on the pacemaker can cause temporary or permanent dysfunction and premature wear of the battery. Radiotherapy on the leads may cause fibrosis and loss of command because of increase in the stimulation threshold.

Contraindications

Contraindications

- Gallium-67 scintigraphy is contraindicated during pregnancy.
- In pregnant women with heart disease, converting enzyme inhibitors and angiotensin I blockers are contraindicated.
- Patients with pacemakers or defibrillators should not undergo magnetic resonance imaging (MRI) tests.

Qualifying Statements

Qualifying Statements

- Data or scientific evidence are not always available to allow all the different situations to be analyzed. As customary in medical practice, minute analysis of the patient and problem and the common sense of the team must prevail.
- The surgical intervention does not finish when the patient is bandaged or leaves the operating room. The concept of the word perioperative includes the need for a postoperative surveillance whose intensity is determined by the individual level of risk of the patient.

Implementation of the Guideline

Description of Implementation Strategy

An implementation strategy was not provided.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Getting Better

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Safety

Identifying Information and Availability

Bibliographic Source(s)

Gualandro DM, Yu PC, Calderaro D, Marques AC, Pinho C, Caramelli B, et al. Disease-specific approaches. In: II guidelines for perioperative evaluation. Arq Bras Cardiol. 2011;96(3 Suppl 1):10-22. [379 references]

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2007 (revised 2011)

Guideline Developer(s)

Brazilian Society of Cardiology - Medical Specialty Society

Source(s) of Funding

Brazilian Society of Cardiology

Guideline Committee

Not stated

Composition of Group That Authored the Guideline

Writing Committee Members: Danielle Menosi Gualandro, Pai Ching Yu, Daniela Calderaro, Bruno Caramelli

Task Force Members: Alina Coutinho Rodrigues Feitosa, André Coelho Marques, Bruno Caramelli, Beatriz Ayub, Carisi A. Polanczyk, Carlos Jardim, Carolina L. Zilli Vieira, Claudio Pinho, Daniela Calderaro, Danielle Menosi Gualandro, Denise Iezzi, Dimas T. Ikeoka, Dirk Schreen, Elbio Antonio D'Amico, Elcio Pfeferman, Emerson Quintino de Lima, Emmanuel de A. Burdmann, Enrique Pachon, Fabio Santana Machado, Filomena Regina Barbosa Gomes Galas, Flávio Jota de Paula, Francine Corrêa de Carvalho, Gilson Soares Feitosa-Filho, Gustavo Faibischew Prado, Heno F. Lopes, José Jaime Galvão de Lima, Julio Flavio Meirelles Marchini, Luciana S. Fornari, Luciano F. Drager, Luciano Janussi Vacanti, Ludhmila Abrahão Hajjar, Luis Eduardo P. Rohde, Luís Henrique Gowdak, Luiz Francisco Cardoso, Marcelo Luiz Campos Vieira, Maristela C. Monachini, Milena Macatrão, Pai Ching Yu, Paula Ribeiro Villaça, Pedro Silvio Farsky, Renato Delascio Lopes, Renato Scotti Bagnatori, Roberto Henrique Heinisch, Sandra F. Menosi Gualandro, Tarso Augusto Duenhas Accorsi, Walkiria Samuel Ávila, Wilson Mathias Jr.

Financial Disclosures/Conflicts of Interest

See the original guideline document for mandatory conflict of interest declaration.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: Committee on Perioperative Evaluation (CAPO), Brazilian Society of Cardiology. Specific assessment. In: I guidelines for perioperative evaluation. Arq Bras Cardiol 2007;89(6):e186-94.

Guideline Availability

Electronic copies: Available in Portable Document Format (PDF) from the Arquivos Brasileiros de Cardiologia Web site

.

Availability of Companion Documents

None available

Patient Resources

None available

NGC Status

This NGC summary was completed by ECRI Institute on June 2, 2008. The information was verified by the guideline developer on July 2, 2008. This summary was updated by ECRI Institute on December 26, 2008 following the FDA advisory on Innohep (tinzaparin). This summary was updated by ECRI Institute on July 27, 2010 following the FDA drug safety communication on Heparin. This NGC summary was updated on November 16, 2011. The updated information was verified by the guideline developer on December 27, 2011. This summary was updated by ECRI Institute on March 10, 2014 following the U.S. Food and Drug Administration advisory on Low Molecular Weight Heparins. This summary was updated by ECRI Institute on June 2, 2016 following the U.S. Food and Drug Administration advisory on Opioid pain medicines.

Copyright Statement

Disclaimer

NGC Disclaimer